been able to determine that the operculum is multispiral and circular, which definitely removes it from the Rissoidae. Dried Japanese and Hawaiian specimens were tested for the radula without success but finally a specimen of *Alabina diomedae* Bartsch from California yielded the desired item, which proved to resemble the radular structure of *Lampania*, as figured by Troschel in Das Gebiss der Schnecken. This definitely settles the Cerithioid relations of the genus, which may find a place near *Bittium* in the general system, as I placed it in my summary of the Marine Mollusks of the Northwest Coast of America.

AN ABNORMAL SHELL OF MYA ARENARIA

BY EDWARD S. MORSE

The many deformations in the shells of Mollusca have often been described and figured and their causes easily explained. Some of these deformations have been due to injuries to the shell in its early stages, others are due to an arrest of development—atrophy, or an access of growth—hypertrophy, as are the usual causes of malformations among the higher animals and man. In shells these malformations generally consist in the case of gasteropods of the whorls being separated, elongation of the spire, extra knobs, spines, ribs or keels or simple monstrosities; reversed twirls of the spire in dextral shells, supernumerary teeth in the aperture. These and other modifications of the shell are readily understood. I now present an example of an abnormal growth which has so far been inexplicable to me, and it is hoped that some reader of the NAUTILUS will solve the problem. Recently I received the right valve of the common clam, *Mya arenaria*, from my friend Major John M. Gould, who received it from Levi C. Carter of Loudville, Maine, who got it at Marsh Island, midway between the Kennebec and Penobscot Rivers.

On the anterior portion of the shell a conspicuous raised flattened rib appears which starts near the beak and continually widens with the growth of the shell, and at the margin projects

a considerable distance beyond as shown in the figures. An examination of the shell under a lens reveals that by some accident at a very early stage the margin of the shell was broken and there began to form a shallow raised ridge very narrow at first but continually widening as the shell increased in size until at the margin of the shell it was not only 20 mm. in width, but projected 7 mm. beyond the margin of the shell. This flattened rib radiated from the umbone as any rib would radiate in a lamellibranchiate shell. The extraordinary character of this rib is that it is hollow, the interior is open throughout, as the wire *A–B* in the figure shows, the posterior half is interrupted by columns of nacreous material which run from the shell to the upper portion of the tube, indeed there seems to be a partition separating the tube into halves. The upper part of the ridge is broken away for a distance of 25 mm. from the umbone, en-

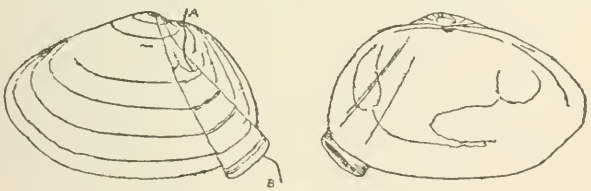

Fig. 1. Abnormal *Mya arenaria*.

abling one to examine the floor of the ridge, and this shows a distinct depression in the shell; on the inside of the shell there is a marked swelling or thickening of the nacre to the extreme border. The upper wall of this ridge projects 5 mm. below the lower wall, which in itself projects 3 mm. below the margin of the shell, thus one is enabled to examine the inner wall of the tube and it is nacreous. Dried animal matter was picked out of the tube. To build this tube a membrane must have had a mantle margin which would secrete layer after layer of shell as the strong lines of growth indicate, as well as epidermis, and the surface of the membrane must have poured out its nacreous layer as the tube is so lined, yet the normal growth of the shell is not interrupted in any way. In some manner a portion of the mantle must have been displaced at the time of the injury to the young shell, if turned back it must have again become reflexed

to bring the edge of the mantle free again. It is unfortunate that the specimen was not preserved alive. The other valve of the shell was perfectly normal.

I cannot recall among the lamellibranch or gasteropod shells, either normal or abnormal, a tubular process, indeed the nearest approach is seen in the little tubular processes on the periphery of Aspergillum.

JEANETTE M. COOKE

Miss Jeannette M. Cooke died at her home on Point Loma in the city of San Diego, California, on October 21st, 1920. She was widely known among conchologists on account of the valuable material which she had accumulated from Lower California, which has gone into many of the great museums of the world and into a very large number of private collections.

She was born at Westford, Vermont, on March 10th, 1843, but went to Elyria, Ohio, when about nine years old. She came to San Diego in 1882 and opened "The World Curio Store" in 1886. This she maintained until about 1908 when she retired from business and moved to Point Loma.

Early in the history of the store she sent out a boat in charge of Captain George D. Porter and John Johnson for the purpose of collecting all sorts of marine life on the coast of Lower California. She made several changes in her boats and, about 1895, she purchased a small Chinese junk which had been built in San Diego, and which they rechristened "The World". In this boat these two men went for a more extended cruise into the Gulf of California.

Tiburon Island, the largest island in the Gulf of California, is inhabited by the notorious Seri Indians, who are the Ishmaelites of that region, their hands having been against all of their neighbors from their earliest recorded history. Miss Cooke told the writer that Capt. Porter had promised her that under no circumstances would they land on Tiburon Island. Nevertheless, about the end of October, 1896, they did land on this large island, were ambushed and killed by the Seris, and their boat